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--FIG. 1 shows a computer network 10 that includes a plurality of computer networks 10a, 10b, and 10c connected to each other by routers 12, 14, and 16. Each computer network 10a, 10b, and 10c may have one or more computers 18a, 18b, and 18c.--

Replace the paragraph beginning at page 3, line 6 with the following rewritten paragraph:

--The following describe mechanism for distributing a control protocol for routers 12, 14 and 16 between control and forwarding planes. The control protocol is implemented by separating a control protocol into a central control portion implemented on a control-plane 22 (FIG. 2) and an off-load control portion implemented on forwarding-planes 24a, 24b and/or 24c. The present mechanism achieves a scalable, fault-tolerant implementation of a control protocol that may be scaled to handle hundreds of ports and/or interfaces. The present mechanism may also handle failure of central control plane software by allowing forwarding planes to continue to respond to control events and operate correctly during a recovery period. The embodiments described herein may be applied to all control protocols, e.g., control protocols, for implementing differentiated packet handling as necessary for quality of service, security, etc.--

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In the claims:

Add claims 31-53.

--31. A router using a distributed implementation of a routing control protocol to route a packet, comprising:

a control-plane having a control-plane processor to implement a first control portion of the control protocol;

a plurality of forwarding-planes, each having a forwarding-plane processor to implement a second control portion of the control protocol; and

a back-plane to connect the control plane to the plurality of forwarding-planes and to enable processing of the packet based on an implementation of the control protocol by the control-plane and the forwarding-plane.

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32. The router of claim 31, wherein the second control portion of the control protocol generates an outgoing control message.

33. The router of claim 31, wherein the second control portion of the control protocol responds to an incoming request to the control protocol.

34. The router of claim 31, wherein the control-plane and the forwarding-planes together implement a plurality of control protocols.

35. The router of claim 31, wherein the forwarding-planes comprise a plurality of ports including a plurality of virtual interfaces on a physical interface.

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36. The router of claim 31, wherein the forwarding-plane processor includes:

a processing engine to implement a plurality of packet processing functions for routing the packet; and

a general purpose processor to implement the second control portion of the control protocol.

37. The router of claim 31, wherein the second control portion of the control protocol operates to reduce a control flow load on the back-plane between the control-plane and the forwarding plane.

38. The router of claim 31, wherein the second control portion of the control protocol operates to reduce a processing load on the control-plane processor.

39. A control-plane for a router using a distributed implementation of a routing control protocol to route a packet, comprising:

a control-plane processor to implement a first control portion of the control protocol and interact with a plurality of forwarding-planes, which implement a second control portion of the control protocol, to enable processing of the packet by the router.

40. The control-plane of claim 39, wherein the control-plane implements a plurality of control protocols.

41. A forwarding-plane for a router using a distributed implementation of a routing control protocol to route a packet, comprising:

a forwarding-plane processor to implement an offload control portion of the control protocol and interact with a control-plane, which implements a central control portion of the control protocol, to enable processing of the packet by the router.

42. The forwarding-plane of claim 41, wherein the offload control portion of the control protocol generates an outgoing control message.

43. The forwarding-plane of claim 41, wherein the offload control portion of the control protocol responds to an incoming request to the control protocol.

44. The forwarding-plane of claim 41, wherein the forwarding-plane comprises a plurality of ports including a plurality of virtual interfaces on a physical interface.

45. The forwarding-plane of claim 41, wherein the forwarding-plane processor includes:

a processing engine to implement a plurality of packet processing functions for routing the packet; and

a general purpose processor to implement the offload control portion of the control protocol.

46. The forwarding-plane of claim 41, wherein the offload control portion of the control protocol operates to reduce a processing load on a control-plane processor.

47. A control-plane processor for a router using a distributed implementation of a routing control protocol to route a packet, the control-plane processor comprising instructions to implement:

a first control portion of the control protocol and interact with a plurality of forwarding-planes, which implement a second control portion of the control protocol, to enable processing of the packet by the router.

48. The control-plane processor of claim 47, wherein the control-plane processor includes instructions to implement a plurality of control protocols.

49. A forwarding-plane processor for a router using a distributed implementation of a routing control protocol to route a packet, the forwarding-plane processor comprising instructions to implement:

an offload control portion of the control protocol and interact with a control-plane, which implements a central control portion of the control protocol, to enable processing of the packet by the router.

50. The forwarding-plane processor of claim 49, wherein the offload control portion of the control protocol generates an outgoing control message.

51. The forwarding-plane processor of claim 49, wherein the offload control portion of the control protocol responds to an incoming request to the control protocol.

52. The forwarding-plane processor of claim 49, comprising:

a processing engine to implement a plurality of packet processing functions for routing the packet; and

a general purpose processor to implement the offload control portion of the control protocol.

53. The forwarding-plane processor of claim 49, wherein the offload control portion of the control protocol operates to reduce a processing load on a control-plane processor.--